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United States Patent [19]
Riddle

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[54] **METHOD AND APPARATUS FOR
ALLOCATING BANDWIDTH IN
TELECONFERENCING APPLICATIONS
USING BANDWIDTH CONTROL**

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[57] **ABSTRACT**

In the present invention, in some embodiments, an administrator assigns a total bandwidth allocation to at least one other computer system, and the computer system parcels the bandwidth among the applications running on the computer system. In the operation of one embodiment of the present invention, an administrator sends a bandwidth maximum allocation to each node on the system. Each node determines a current bandwidth being used, and limits the current bandwidth to this allocation. Thereafter, each node then reallocates its usable bandwidth among applications running on the nodes that are attempting to send messages over the network. For each application, a current bandwidth use is determined, as well as a current bandwidth demand. The current bandwidth demand is the amount of bandwidth that the application would be using if no other applications were running on the node and if there were no limitations on the amount of data the application could send to the network. A ratio is calculated to determine the amount of the bandwidth demand currently being satisfied for each application, thus calculating the happiness factor for the application.

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[58] **Field of Search** 395/200.53, 200.56,
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200.5, 200.51, 200.52, 200.54, 200.55,
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[56] **References Cited**

U.S. PATENT DOCUMENTS

5,600,797 2/1997 Marshall 709/224
5,604,742 2/1997 Colmant et al. 370/396
5,673,393 9/1997 Marshall et al. 395/200.04

4 Claims, 13 Drawing Sheets

